Cody Permann

1687 Sunny Pine Way Idaho Falls, ID 83404 (208) 521-7514

EXPERIENCE

Computational Frameworks Research Scientist

Idaho National Laboratory

2008 - present

Worked as a core developer on the MOOSE (Multiphysics Object-Oriented Simulation Environment) framework, which is a high performance, parallel, fully implicit, finite element simulator. My duties include contributions to the core framework, management of the collaboration and source control services, assisting and instruction users on the use of the framework, and running large parallel jobs on INLs supercomputing resources.

High Performance Computing Application Consultant

Idaho National Laboratory

2000 - 2008

High Performance Computing Application Consultant responsible for efficient application utilization of various HPC class machines. My responsibilities included creating and/or maintaining the Bioinformatics applications and utilizing the HPC resources as appropriate for larger scale problems, working on a large scale Waste Tracking System contract for Ontario Power Generation in Toronto, Canada, assisting in configuring, troubleshooting and using many operating systems including Linux variants, Mac OS X, and Windows. Finally, I created and maintained numerous scripts to automate both scientific and business processes.

EDUCATION

Mississippi State University

Sept 2010 - present

Computational Engineering Ph.D. Program

University of Idaho

Dec 2010

M.S. Computer Science

 $GPA \ 4.0/4.0$

Specialites in HPC, OpenCL, Compilers, and Genetic Programming

Idaho State University

May 2000

B.S. Computer Science

GPA 3.8/4.0

Strong Background in Mathematics and Information Systems

SPECIAL SKILLS

Scientific Software Development

Extensive experience with finite element frameworks (MOOSE), Numerical libraries, Massively parallel programming, Threading, Extensive Linux, Unix and Mac OS X experience, Advanced collaborative version control

Databases

Databases, SQL Server, Adaptive Server Anywhere, MySQL, XML

Middle Tier / Client-Server / General Programming / Scripting

C/C++, .NET, J2EE (including EJBs), PowerBuilder, Windows API Programming, Python, Perl, X86 assembly, OpenGL, OpenCL

Web Technologies

ASP, ASP.NET, Cold Fusion MX, Flash MX, DHTML, JavaScript

Cody Permann Page 2

FUNDED RESEARCH

D. Gaston, C. Permann, D. Andrs, and J. Peterson. Moose enhancements in support of full core modeling, 2013. LDRD.

JOURNAL ARTICLES

- L. Guo, H. Huang, D. Gaston, C. Permann, D. Andrs, G. Redden, C. Lu, D. Fox, and Y. Fujita. A parallel fully coupled fully implicit solution to reactive transport in porous media using preconditioned Jacobian-Free Newton-Krylov method. *Advances in Water Resources*, 53:101–108, March 2013.
- R. L. Williamson, J. D. Hales, S. R. Novascone, M. R. Tonks, D. R. Gaston, C. J. Permann, D. Andrs, and R. C. Martineau. Multidimensional multiphysics simulation of nuclear fuel behavior. *J. Nuclear Materials*, 423:149–163, 2012.
- M.R. Tonks, D. Gaston, P.C. Millett, D. Andrs, and P. Talbot. An object-oriented finite element framework for multiphysics phase field simulations. *Comp. Mat. Sci.*, 51(1):20–29, 2012.
- M. Tonks, D. Gaston, C. Permann, P. Millett, G. Hansen, and D. Wolf. A coupling methodology for mesoscale-informed nuclear fuel performance codes. *Nucl. Eng. Design*, 240:2877–83, 2010.
- Michael Tonks, Derek Gaston, Cody Permann, Paul Millett, Glen Hansen, and Dieter Wolf. A coupling methodology for mesoscale-informed nuclear fuel performance codes. *Nucl. Engrg. Design*, 240(10):2877–2883, 2010.
- D. Gaston, G. Hansen, S. Kadioglu, D. Knoll, C. Newman, H. Park, C. Permann, and W. Taitano. Parallel multiphysics algorithms and software for computational nuclear engineering. *Journal of Physics: Conference Series*, 180(1):012012, 2009.
- M. R. Tonks, G. Hansen, D. Gaston, C. Permann, P. Millett, and D. Wolf. Fully-coupled engineering and mesoscale simulations of thermal conductivity in UO₂ fuel using an implicit multiscale approach. *Journal of Physics: Conference Series*, 180(1):012078, 2009.

CONFERENCE PAPERS

G. Hansen, C. Newman, D. Gaston, and C. Permann. An implicit solution framework for reactor fuel performance simulation. In 20th International Conference on Structural Mechanics in Reactor Technology (SMiRT 20), paper 2045, Espoo (Helsinki), Finland, August 9–14 2009.

INVITED TALKS

- C. Permann, M. Tonks, and D. Gaston. Order parameter re-mapping algorithm for 3d phase field modeling of grain growth coupled to mechanics using fem. In 12th U.S. National Congress on Computational Mechanics, Raleigh, North Carolina, July 2013.
- D. Gaston, C. Permann, D. Andrs, and J. Peterson. In *MOOSE Workshop*, Starkville, MS, April 10-12 2012.

CONFERENCE TALKS

- D. Gaston, C. Permann, D. Andrs, and J. Peterson. Hybrid parallelism for massive scale, fully coupled, fully implicit multiphysics simulation. In *SIAM Parallel Processing for Scientific Computing*, Savannah, GA, Feb 15–17 2012.
- S. R. Novascone, R. L. Williamson, J. D. Hales, M. R. Tonks, D. R. Gaston, C. J. Permann, D. Andrs, and R. C. Martineau. A Multidimensional and Multiphysics Approach to Nuclear Fuel Behavior Simulation. In American Nuclear Society, editor, *Proceedings of PHYSOR 2012*, Knoxville, Tennessee, April 15-20, 2012.
- J. Hales, D. Andrs, D. Gaston, S. Novascone, C. Permann, M. Tonks, and R. Williamson. Fully coupled, implicit, 3-d, multi-physics for analysis of nuclear fuel. In 11th US National Congress on Computational Mechanics, USNCCM11, Minneapolis, MN, 2011.
- D. Gaston and C. Permann. Hybrid parallelism for preconditioned jacobian-free newton-krylov. In SIAM Conference on Parallel Processing for Scientific Computing, PP10, Seattle, Washington, February 24–26 2010.

Cody Permann Page 3

V. Thompson, D. Reed, K. Schaller, J. Barnes, and C. Permann. Proteomic analysis of carboxy-dothermus hydrogenoformans grown on carbon monoxide or syngas. In *The Annual Meeting and Exhibition 2007*, 2007.

- D. Gaston, C. Permann, D. Andrs, and J. Peterson. In *MOOSE Workshop*, Boston, MA, January 10-12 2012.
- D. Gaston, C. Permann, D. Andrs, J. Peterson, M. Tonks, J. Hales, R. Williamson, and L. Guo. Massively parallel multiphysics simulation using an object-oriented framework. In *The Second Annual CAES Workshop on Modeling, Simulation and Visualization*, Boise, ID, Sep 8-9 2011.
- D. Gaston, C. Newman, G. Hansen, and C. Permann. Moose: A parallel computational framework for coupled systems of nonlinear equations. In *Oregon State University Department of Nuclear Engineering*, Corvalis, OR, July 9 2009.